

WHAT IS CLAIMED IS:

1. A wireless telephone coupler for connecting a modem to a wireless communication path via the hands-free circuitry of a wireless telephone comprising:

an RJ-11 plug for connection to said modem;

an interface current source coupled to said RJ-11 plug; and

a voice circuit receiving the audio output signal of said modem, said voice circuit comprising:

(a) an RC input circuit substantially matching the nodal impedance of said modem;

(b) a socket having a shield, ring and tip conductor;

(c) a receiving amplifier having an input coupled to said tip conductor of said socket and an output coupled to said RC input circuit; and

(d) a transmit amplifier having an input coupled to said RC input circuit and an output coupled to said ring conductor of said socket, the gain of said transmit amplifier being (i) non-zero for audio modem signals received from said modem and (ii) approximately zero or sufficiently low for any signals at the output of said receiver amplifier so that any resulting echo does not interfere with the transmission of said audio modem signals through said voice circuit; and

(e) a signal inverter cable connecting said socket of said voice circuit to a wireless telephone comprising:

(a) a first and second plug each having a shield terminal, a ring terminal and a tip terminal;

(b) a first shielded conductor connected from the tip terminal of said first plug to the ring terminal of said second plug, said shield being connected to the shield terminal of both of said plugs; and

(c) a second shielded conductor connected from the ring terminal of said first plug to the tip terminal of said second plug, said shield being connected to the shield terminal of both of said plugs.

2. A wireless telephone coupler for connecting a modem to a wireless communication path via the hands-free circuitry of a wireless telephone comprising:

- an RJ-11 plug for connection to said modem, an RF filter and interface current source coupled to said RJ-11 plug;
- a voice circuit receiving the audio output signal of said modem, said voice circuit comprising:

- (a) an input circuit substantially matching the nodal impedance of said modem;
- (b) a socket having a shield, ring and tip conductor;
- (c) a receiving amplifier having an input coupled to said ring conductor of said socket and an output coupled to said RC input circuit;
- (d) a transmit amplifier having an input coupled to said audio RC input circuit and an output coupled to said tip conductor of said socket, the gain of said transmit amplifier being (i) positive for audio modem signals received from said mode and (ii) approximately zero or sufficiently low for any signals at the output of said receiver amplifier so that any resulting echo does not interfere with the transmission of said audio modem signals through said voice circuit; and
- (e) a non-inverter cable connecting said socket of said voice circuit to a wireless telephone comprising:
 - (a) a first and second plug each having a shield terminal, a ring terminal and a tip terminal;
 - (b) a first shielded conductor connected from the tip terminal of one of said first plug to the tip terminal of said second plug, said shield being connected to the shield terminal of both of said plugs, and
 - (c) a second shielded conductor connected from the ring terminal of said first plug to the ring terminal of said second plug, said shield being connected to the shield terminal of both said plugs.

3. A wireless telephone coupler for connecting a data communications device to a wireless communication path via the hands-free circuitry of a wireless telephone comprising:

an input plug for connection to said data communications device; and
a voice circuit receiving the audio output signal of said data communications device, said voice circuit comprising:

- (a) an input circuit substantially matching the nodal impedance of said data communications device;
- (b) a multiple-conductor socket having a shield and first and second conductors;
- (c) a receiving amplifier having an input coupled to one of said conductors of said multiple-conductor socket and an output coupled to said input circuit; and
- (d) a transmit amplifier having an input coupled to said input circuit and an output coupled to the other of said conductors of said multiple-conductor socket, the gain of said transmit amplifier being (i) non-zero or negative for audio data communications device signals received from said data communications device and (ii) approximately zero or sufficiently low for any signals at the output of said receiver amplifier so that any resulting echo does not interfere with the transmission of said audio data communications device signals through said voice circuit.

4. The wireless telephone coupler of Claim 3 wherein said handset circuitry includes a triaxial substantially 2.5 mm 3-conductor socket.

5. The wireless telephone coupler of Claim 3 wherein said handset circuitry includes an adapter appropriate to a particular wireless telephone..

6. The wireless telephone coupler of Claim 3, including an inverter cable connecting said socket of said voice circuit to a wireless telephone comprising:

- (a) a first and second plug each having a shield terminal, a first terminal and a second terminal;

(b) a first shielded conductor connected from the first terminal of said first plugs to the second terminal of said second plug, said shield being connected to the shield terminal of both of said plugs; and

(c) a second shielded conductor connected from the second terminal of said first plug to the first terminal of said second plug, said shield being connected to this shield terminal of both of said plugs.

7. The wireless telephone coupler of Claim 3, wherein said input plug is an RJ-11 plug.

8. The wireless telephone coupler of Claim 3, including a cable connecting said socket to a wireless telephone includes at one end of said cable a substantially 2.5 mm plug for connecting to said handset socket of said wireless telephone.

9. The wireless telephone coupler of Claim 3, wherein said input circuit substantially matching the nodal impedance of said data communications device includes electrical resistance and capacitance for closely matching the nodal impedance of said data communications device and cables connecting said data communications device to the coupler.

10. The wireless telephone coupler of Claim 3, including an RF filter at the input of said voice circuit for substantially eliminating RF energy on the audio output conductor from said data communications device.

11. The wireless telephone coupler of Claim 3, including a Zenor diode at the input of said coupler to protect said coupler in the event that a user incorrectly connects said input to a conventional telephone line.

12. The wireless telephone coupler of Claim 3, including a battery source of d.c. current for said data communications device.

13. The wireless telephone coupler of Claim 3, having a switch for selecting high or low data communications device current.

14. The wireless telephone coupler of Claim 3, having a switch for selecting the appropriate attenuation of the coupler output signal for said wireless telephone.

15. The wireless telephone coupler of Claim 3, including a clamping circuit for maintaining a battery supplied voltage only during the off-hook data communications device

condition so that an extremely low current is drawn from said battery during on-hook data communications device conditions.

16. The wireless telephone coupler of Claim 12, including a series of LEDs enabled to be coupled to said battery to indicate the voltage of said battery.

17. The wireless telephone coupler of Claim 12 wherein is a cell phone operable in an analog cellular network.

18. The wireless telephone coupler of Claim 12 wherein said wireless telephone is a cordless telephone.

19. The wireless telephone coupler of Claim 12 wherein said data communications device is a computer having a modem.

20. A wireless telephone coupler for connecting a modem to a wireless communication path via the multiple-conductor circuit provided by wireless telephones for hands-free communication, said coupler comprising:

an input plug for connection to said modem; and

a circuit receiving the audio output signal of said modem, said circuit including:

(a) an input circuit substantially matching the nodal impedance of said modem;

(b) a receiving amplifier having an input coupled to one of said conductors of said multiple-conductor circuit and an output coupled to said input circuit; and

(c) a transmit amplifier having an input coupled to said input circuit and an output coupled to another of said conductors of said multiple-conductor circuit, the gain of said transmit amplifier being (i) non-zero for audio modem signals received from said modem and (ii) approximately zero or sufficiently low for any signals at the output of said receiver amplifier so that any resulting echo does not interfere with the transmission of said audio modem signals through said voice circuit.

21. A wireless telephone coupler for connecting a modem to a wireless communication path via circuitry provided by wireless telephones for hands-free communications, said coupler comprising:

an input plug for connection to said modem; and
a circuit receiving the audio output signal of said modem, said circuit comprising:

- (a) a receiving amplifier having an input coupled to said hands-free circuitry and an output coupled to said input plug; and
- (b) a transmit amplifier having an input coupled to said input plug and an output coupled to said hands-free circuitry, the relative gains of said amplifiers reducing any resulting echo sufficiently to not interfere with the transmission of said audio modem signals to said wireless telephone.

22. A method for testing a wireless telephone coupler adopted to connect a modem to a wireless communication path via the hands-free circuitry of a wireless telephone including:

coupling the output of a transmit amplifier to the one conductor of said hands-free circuit and the input of said transmit amplifier to the output of said modem;

coupling the input of a receiving amplifier to another conductor of said hands-free circuit; and

coupling a hands-free headset to the output of said transmit amplifier and the input of said receiving amplifier and determining that the audio modem signal is being received at said headset.

23. A wireless telephone coupler for connecting a modem to a wireless communication path via a wireless telephone comprising:

receiving amplifier means coupled between said wireless telephone and the output of said modem,

transmit amplifier means coupled between the output of said modem and said wireless telephone, said transmit amplifier having a non-zero positive or negative gain for audio frequency signals from said modem and substantially zero gain for signals at the output of said receiving amplifier, and

means coupling the output of said transmit amplifier and the input of said receiver amplifier to the hands-free handset socket or adapter interface of said wireless telephone.

24. A wireless telephone coupler for connecting a data communications device to a wireless communication path via the circuit provided by wireless telephones for hands free audio communication, said coupler comprising:

an input plug for connection to said data communications device;

an interface circuit to said device enabling communication to and from said data communications device; and

a conversion circuit for transmitting output data of said data communications device to said telephone and for receiving distant data from said telephone and directing said distant data to said data communications device , said conversion circuit including:

(a) a receive circuit having an input coupled to one of said conductors of said hands-free circuit and an output coupled to said interface circuit, the gain of said receive circuit being non-zero for any distant data signals at said input; and

(b) a transmit circuit having an input coupled to said input circuit and an output coupled to another of said conductors of said hands-free circuit, the gain of said transmit circuit being:

(i) non-zero for data signals received from said data communications device; and

(ii) substantially zero for any distant data signals at the output of said receive circuit.